Overview

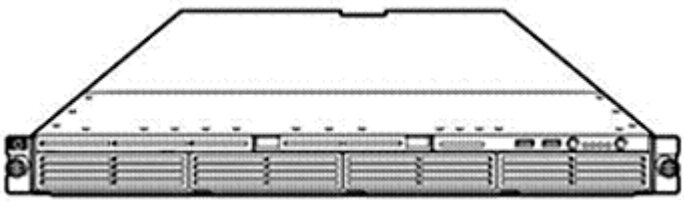
Does data growth leave you struggling with complex, distributed, and costly data protection? Keep pace with HP disk-based data protection.

HP StoreOnce Backup systems with HP StoreOnce deduplication deliver daily onsite backup of small or mid-size data centers, network efficient remote office protection, rapid data restore and reliable offsite disaster recovery. Offering leading price-performance, you can start small and upgrade capacity and performance to meet ever shrinking backup windows, while automating data protection to simplify management, reduce IT intervention, and improve reliability.

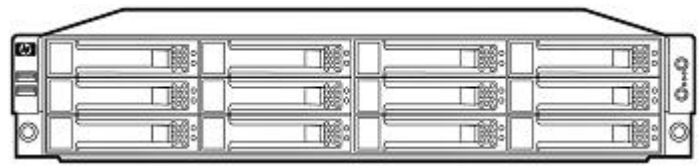
All HP StoreOnce Backup systems feature HP StoreOnce deduplication software for efficient, longer term data retention on disk and enabling network efficient replication for a cost-effective way of transmitting data off-site for disaster recovery purposes. The StoreOnce Backup systems integrate seamlessly into your current IT environment and offer you the flexibility of both virtual tape library and NAS targets.

NOTE: Actual performance is dependent upon data set type, compression levels, number of data streams, number of devices emulated and number of concurrent tasks, such as housekeeping or replication.

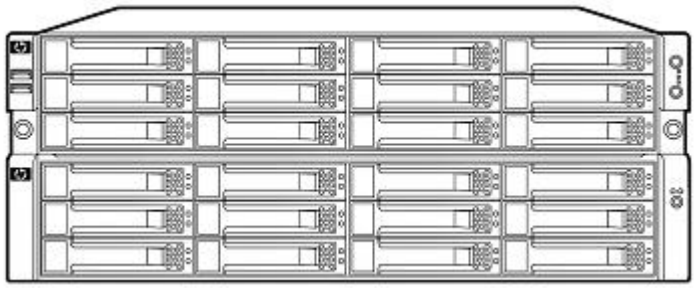
* For legacy D2D backup systems (EJ001A, EJ002A, EH938A, EH939A, EH941A, EH942A, EH999A), the addition of NAS as a target for backup is limited to the CIFS protocol, suitable for use in Windows-only environments. Earliest legacy systems used authentication models for the CIFS protocol of "no authentication" or "local user level authentication". There was no support for Microsoft Active Directory authentication. However support for Microsoft Active Directory authentication is available on legacy systems via a free firmware upgrade by following the "Support & Drivers" link on www.hp.com/go/d2d or by following the "HP Support & Drivers" link from: www.hp.com EJ001C, EJ002C, EH993C EH996B, EH998B, EH985A and EH983B support CIFS, with Microsoft Active Directory authentication and NFS protocols.



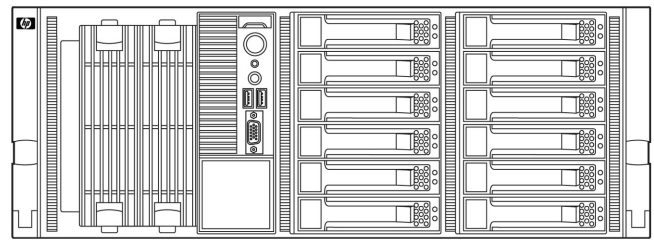
HP D2D2500 Backup system



HP D2D4106 Backup system



HP D2D 4106 and D2D4112 Backup system with D2D4106 or D2D4112/4312 Upgrade Kit



HP D2D4312 and D2D4324 Backup system

Overview

What's New

- HP StoreOnce Replication Manager 2.0 allows users to monitor, report and manage multiple StoreOnce backup systems' GUI's through a single management console.
- Replication Manager 2.0 provides an easier way to monitor backup targets showing trends analysis, enhanced topology view and email alert notification for up to 400 StoreOnce backup systems, being replicated to a central site.
- HP D2D4324 Backup system for enterprise data centers delivers a scalable 4U solution from 18 to 72 TB of usable capacity. The highest capacity and performance* point in the HP StoreOnce Backup system family, it automates the daily backup of multiple servers through the flexibility of virtual tape library and NAS (CIFS & NFS) interfaces.
- HP StoreOnce Open Storage Technology (OST) plug-in integrates deduplicated replication data with Symantec backup applications

* Actual performance is dependent upon data set type, compression levels, number of data streams, number of devices emulated and number of concurrent tasks, such as housekeeping or replication.
** Replication Manager 2.0 software is available with the following replication licenses (EH991A, EH994A, EH984A, EH999A and EH985A).
In order to benefit from Replication Manger, StoreOnce backup systems require the latest firmware, which can be obtained via a free firmware upgrade by following the "Support & Drivers" link on www.hp.com/go/d2d or by following the "HP Support & Drivers" link from: www.hp.com

Features and Benefits

Make backup easier	HP StoreOnce Backup systems work with your backup application to help automate and improve the backup process while reducing the time spent managing data protection. Implementing unattended daily backup to disk is especially valuable for environments with limited IT resources.
Keep pace with data growth	Most HP StoreOnce Backup systems (apart from the entry level D2D2500 series), allow you to grow usable capacity as your backup data requirements grow. The D2D4324 allows you to scale up from 18 to 72 TB of usable capacity, the D2D4312 allows you to scale up from 9 to 36TB of usable capacity, The D2D4112 from 9 to 18 TB of usable capacity and the D2D4106 from 4.5 to 9 TB of usable capacity as your data storage requirements grow, by using a simple and cost effective capacity upgrade for a lower cost alternative to purchasing additional systems.
Improve backup efficiency with data deduplication	Why continue to store the same data over and over again with each backup? HP StoreOnce deduplication reduces the disk space required to store backup data sets by typically 20x by eliminating duplicate data without impacting backup performance. This means that you can retain more backup data on disk for longer, and enables greater data accessibility for rapid restore of lost or corrupt files.
Meet shrinking backup windows	StoreOnce Backup systems can simultaneously back up multiple servers on a standard 1 or 10Gb Ethernet or 4 and 8 Gb Fibre Channel network to a single disk-based solution. With up to 50 backup streams configured to a single StoreOnce backup system you can achieve backup performance of up to 4TB/hour to reduce your backup window.
Improve data protection at remote offices	The HP StoreOnce Backup systems with HP StoreOnce deduplication reduces the network bandwidth needed to transmit data offsite. This enables cost-effective, network efficient data replication to automate and centralize backup from remote sites or branch offices Replication manager*, included with the replication license, provides an easier way to centrally manage a large number of devices being replicated to a central site. StoreOnce Backup systems offer an intuitive web-based browser interface allowing you to monitor your StoreOnce Backup system, locally or remotely, to view results or change settings. This self-managing device also reduces your routine maintenance. * Replication Manager software is available with the following replication licenses (EH990A , EH991A, EH994A, EH984A, EH999A and EH985A). In order to benefit from Replication manger, StoreOnce backup systems require the latest firmware, which can be obtained via a free firmware upgrade by following the "Support & Drivers" link on www.hp.com/go/d2d or by following the "HP Support & Drivers" link from: www.hp.com
Deliver reliable disaster recovery	With HP StoreOnce enabled replication, lower cost transmission inks make network-based disaster recovery a practical alternative. You can use HP StoreOnce backup systemsto deliver a consolidated disaster recovery solution for the data center.
Enable rapid file restores	Deduplication means that up to 20x more backup data can be kept on-hand for rapid disk-based file access and restore to minimize disruption and loss of productivity.
Simplify backup in complex environments	The StoreOnce Backup systems offer virtual tape library and NAS targets for backup applications allowing for ease of use and integration in to existing IT environments and provide a way to consolidate data from

across the organization to a single Backup system. This not only simplifies backup but means that restore is easier too.
The 1U, 2U, 4U StoreOnce Backup systems are easily rack-mounted in standard racks for efficient use of space in the data center and remote offices. Supported by all leading backup applications, this allows each system to be installed and used without additional investment in software.

Enhance reliability

By automating and consolidating backup you can reduce operator intervention and consequently user-generated errors. Furthermore, HP StoreOnce Backup systems include hardware-based RAID 5 or RAID 6 to reduce the risk of data loss due to disk failure.

Special Features

HP StoreOnce deduplication - keep more data on disk for longer

Data deduplication is a method of reducing storage needs by eliminating redundant data so that over time only one unique instance of the data is actually retained on disk. As a result, typically 20x more backup data can be retained (up to 1.4 petabytes) in the same disk footprint.

Adding data deduplication to disk-based backup delivers a number of benefits:

- A cost effective way of keeping your backup data on disk for a number of weeks or even months. More efficient use of disk space effectively reduces the cost-per-gigabyte of storage and the need to purchase more disk capacity.
- Making file restores fast and easy from multiple available recovery points. By extending data retention periods on disk, your backup data is more accessible for longer periods of time, before archiving to tape. In this way, lost or corrupt files can be quickly and easily restored from backups taken over a longer time span.
- Ultimately, data deduplication makes the replication of backup data over lower bandwidth WAN links viable (providing offsite protection for backup data) as only changed data is sent across the connection to a second device (either a second identical device or one that comes from this product family).

HP StoreOnce deduplication

HP StoreOnce deduplication software simplifies the deployment of deduplication technology across IT infrastructures. With explosive data growth driving IT sprawl, deduplication technology is quickly becoming a requirement for many customers to help reduce the capacity required to store information.

- Traditional deduplication technologies tend to approach the problem from a fragmented perspective and this results in multiple deduplication methodologies being deployed adding to the management complexity of the infrastructure. HP StoreOnce is different; as a next generation deduplication architecture, it is not sold as standalone software, but rather is a portable engine that can be consistently embedded in multiple products, eliminating the complexity of first generation deduplication. HP StoreOnce uses patented innovation and features designed by HP Labs to maximize backup and restore performance while minimizing management and hardware overhead.

How it works

Deduplication works by examining the data stream as it arrives at the storage appliance, checking for blocks of data that are identical and eliminating redundant copies. If duplicate data is found, a pointer is established to the original set of data as opposed to actually storing the duplicate blocks, removing or "deduplicating" the redundant blocks from the volume. The key here is that the data deduplication is being done at the block level to remove far more redundant data than deduplication done at the file level where only duplicate files are removed.

Data deduplication is especially powerful when it is applied to backup, since most backup data sets have a great deal of redundancy. The amount of redundancy will depend on the type of data being backed up, the backup methodology and the length of time the data is retained.

Example. Backing up a large customer database that gets updated with new orders throughout the day. With the typical backup application you would normally have to back up, and store the entire database. Even incremental backups will result in storing the full database to disk once again, taking up increasing amounts of disk space with almost identical backup data sets. With block-level deduplication, you can backup the same database to the device on two successive nights and, due to its ability to identify redundant blocks, only the blocks that have changed will be stored. All the redundant data will have pointers established.

The HP approach to deduplication
HP StoreOnce deduplication software simplifies the deployment of deduplication technology across IT infrastructures. With explosive data growth driving IT sprawl, deduplication technology is quickly becoming a requirement for many customers to help reduce the capacity required to store information.

Traditional deduplication technologies tend to approach the problem from a fragmented perspective and this results in multiple deduplication methodologies being deployed adding to the management complexity of the infrastructure. HP StoreOnce is different; as a next generation deduplication architecture, it is not sold as standalone software, but rather is a portable engine that can be consistently embedded in multiple products, eliminating the complexity of first generation deduplication. HP StoreOnce uses patented algorithms and features designed by HP Labs to maximize backup and restore performance while minimizing management and hardware overhead.

HP StoreOnce deduplication software is not sold as standalone software but designed to be portable, it can be embedded in multiple products. All HP StoreOnce Backup systems including systemHP B6000 and HP Data Protector 6.2.1 include the HP StoreOnce deduplication engine.
Most StoreOnce customers using the earlier HP Dynamic deduplication technology can upgrade their firmware to improve performance and enable replication to newer systems based on HP StoreOnce.

NOTE: The HP VLS product family uses deduplication based on object-level data deduplication for increased performance in large scale Fibre Channel deployments. These deduplication technologies are not compatible; they use different technologies and cannot be used together.

For more information on HP StoreOnce deduplication refer to the white papers available on http://www.hp.com/go/d2d

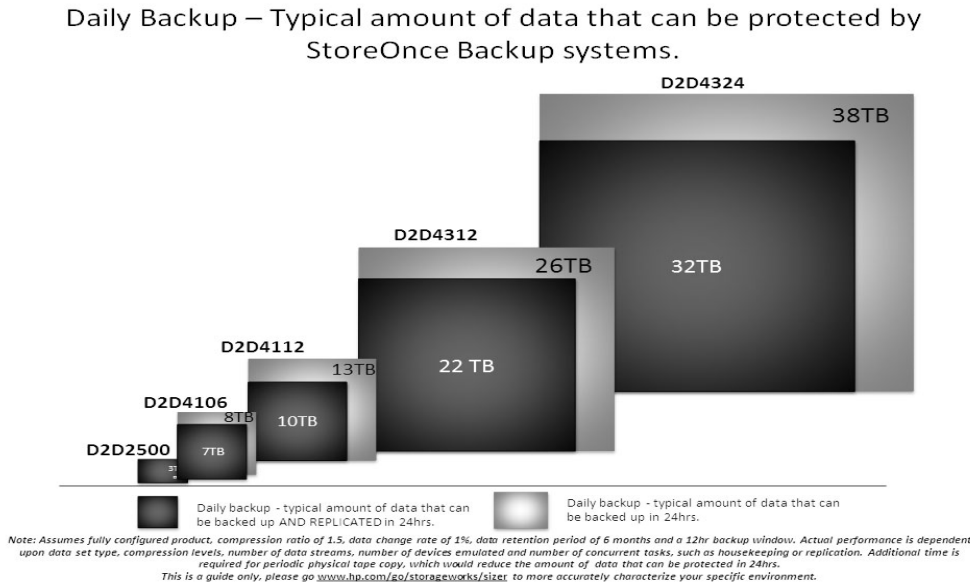
What deduplication ratio can I expect?
The actual data deduplication ratio you can expect will depend on a number of factors including: the type of data, the backup methodology used, and the length of time you retain your data. However, assuming standard business data mix and extended on disk retention (periods of more than 12 weeks) you could expect to see:
20:1 capacity ratio assuming a weekly full and daily incremental backup model

Is there likely to be any impact on performance?
The graphic below aims to illustrate that the actual performance achieved using a StoreOnce Backup system is dependent upon a number of factors including data set type, compression levels, number of data streams, number of devices emulated and number of concurrent tasks, such as backup and deduplication, housekeeping, and replication. In general, the more process steps, the longer it may take.

Features and Benefits

Consequently, when compared to backup alone, a reduced amount of data will be backed up AND replicated by each StoreOnce Backup system within the same timeframe.

The illustration assumes a fully configured product, a compression ratio of 1.5, a data change rate of 1%, a data retention period of 6 months and a 10hr backup window. Each box in the diagram depicts how much data can be typically protected by each model of HP StoreOnce Backup systems on a daily basis. It compares the difference between solely conducting backup with data deduplication, to performing backup and data deduplication with the addition of a data replication process.


Daily Backup – Typical amount of data that can be protected by StoreOnce Backup systems.
D2D4324
38TB
32TB
D2D4312
26TB
22 TB
D2D4112
13TB
10TB
D2D4106
8TB
7TB
D2D2500
Daily backup - typical amount of data that can be backed up AND REPLICATED in 24hrs.
Daily backup - typical amount of data that can be backed up in 24hrs.
Note: Assumes fully configured product, compression ratio of 1.5, data change rate of 1%, data retention period of 6 months and a 12hr backup window. Actual performance is dependent upon data set type, compression levels, number of data streams, number of devices emulated and number of concurrent tasks, such as housekeeping or replication. Additional time is required for periodic physical tape copy, which would reduce the amount of data that can be protected in 24hrs.
This is a guide only, please go www.hp.com/go/storageworks/sizer to more accurately characterize your specific environment.

The new HP B6200 StoreOnce Backup system extends this data protection to provide up to 224TBs in an 8 hour window. Please refer to the B6200 if you require higher performance disk backup systems. See www.hp.com/go/b6200 for more details

Note also, that all forms of data deduplication can have a particular impact on tape offload performance, as data must be rehydrated before it is stored to tape. The StoreOnce Backup system is designed for daily t backup, however, tape should still have an important part in cost-effective longer term archival or where data replication is not used for off-site disaster recovery. Continuing to off-load from the StoreOnce device to tape on a daily basis may have a negative impact on performance.

For help with choosing the most appropriate StoreOnce Backup systems for your specific environment, we recommend you talk to your HP partner or sales advisor about using the HP storage Sizing Tool which can be downloaded from the Downloads section of www.hp.com/go/ d2dsizer

Making use of the StoreOnce backup system's ability to run multiple backups in parallel can substantially improve aggregate throughput to a StoreOnce appliance. This and a number of other best practices can help you to optimize the performance of a StoreOnce Backup system. Please refer to: HP StoreOnce Backup system, Best Practices for Performance Optimization which can be found at StoreOnce Best Practices for Performance Optimization.
http://bizsupport2.austin.hp.com/bc/docs/support/SupportManual/c02511912/c02511912.pdf

For more information on achieving deduplication ratios go to: www.hp.com/go/deduplication

Data replication - network efficient disaster recovery

Data replication is the process of making a replica copy of a data set across a network to a "target site". It is generally used to transmit backup data sets off-site to provide disaster recovery (DR) protection in the event of catastrophic data loss at the "source site"

In the past, only the largest companies could afford to implement data replication as replicating large volumes of data backup over a typical WAN is expensive. However, today's StoreOnce products with data deduplication have made it possible to replicate data over lower bandwidth links for a more cost-effective, network efficient replication solution that provides a practical disaster recovery solution for most sizes of business, in addition to an ideal solution for centralizing the backup of remote offices.

Data deduplication shrinks the amount of backup data that needs to be replicated from the source HP StoreOnce appliance, and as a result significantly reduces replication bandwidth requirements. Once a replica of the data backup set has been created on a remote HP StoreOnce target appliance, all that is required to keep the replica identical to the source is the automatic, periodic copying and movement of the new data segments which are created during each backup. With such small amounts of data being transmitted asynchronously, lower bandwidth networks offer sufficient performance and a much lower cost solution.

HP's data replication feature includes replication bandwidth limiting functionality, restricting the amount of bandwidth being used when replicating data for even more network-efficient replication. Without replication bandwidth limiting, a replication job could use as much bandwidth as is available, potentially making other network activities unresponsive. Replication bandwidth limiting is customer configurable at the appliance level via the graphical user interface and is set as a percentage of the available network bandwidth.

The following HP StoreOnce Backup systems are available with replication which may be licensed by target.

D2D2502i - a total of 4 source appliances can replicate to a single D2D2502i target
D2D2504i - a total of 8 source appliances can replicate to a single D2D2504i target
D2D4000 - a total of 16 source appliances can replicate to a single D2D4000 target
D2D4106 - a total of 16 source appliances can replicate to a single D2D4106 target
D2D4112 - a total of 24 source appliances can replicate to a single D2D4112 target
D2D4312 - a total of 50 source appliances can replicate to a single D2D4312 target
D2D4324 - a total of 50 source appliances can replicate to a single D2D4324 target

See the 'Related Options - Replication licenses' section of this document for ordering and fulfillment information for Replication licenses, Replication Manager and OST Plug-ins.

Once a license has been obtained, configuring and using replication is made straightforward by the graphical user interface and configuration wizard on the HP StoreOnce appliance.

HP StoreOnce Replication Manager 2.0 allows users to monitor, report and manage multiple StoreOnce backup systems' GUI's through a single management console. Replication Manager 2.0 provides an easier way to monitor backup targets, showing trends analysis, enhanced topology view and email alert notification for up to 400 StoreOnce backup systems, being replicated to a central site. Replication Manager 2.0 provides basic trends analysis of capacity usage, replication up times and utilization analysis. This analysis can be exported in CSV format. Replication Manager 2.0 includes real time graphical views (with auto refresh), active directory group setting firmware identification, and a Command Line Interface.

Features and Benefits

Replication Manager 2.0 supports windows 32 and 64-bit support.

Replication Manager software is available with the following replication licenses (EH990A, EH991A, EH994A, EH984A, EH999A and EH985A).

In order to benefit from Replication manger, StoreOnce backup systems require the latest firmware, which can be obtained via a free firmware upgrade by following the "Support & Drivers" link on www.hp.com/go/d2d or by following the "HP Support & Drivers" link from: www.hp.com

Symantec's Open Storage Technology (OST) is an API (Application Programming Interface) that allows third party storage devices to integrate with Symantec backup software (NetBackup) in order to offer improved management of duplicated copies of backups without the limitations of tape emulation.

With HP's OST plug-in installed on Media Servers, Symantec backup applications (i.e. NetBackup) will have visibility to replicated copies of backups on remote StoreOnce Backup systems. This provides seamless integration into the backup administrator's workflow. Replicated copies are tracked by the backup application; content for both copies is maintained in the local backup domain's catalog.

NOTE: Replication of data can occur between devices within the same product family i.e. between the HP D2D2500, D2D4000, D2D4112, D2D4312 and D2D4324 Backup systems. However, replication is not supported outside this configuration. It is not possible to replicate data from the D2D2500 to the D2D100 Backup system, VLS product ranges nor to competitors' disk based backup systems with replication features.

Choosing the best backup target for data protection - VTL or NAS*

While originally released as a virtual tape library, StoreOnce Backup systems are capable of supporting both VTL and NAS targets for backup applications on a single platform.

A virtual tape library (or VTL) is a disk-based solution which sits between your server and your physical tape drive/library to provide faster data backup, greater data availability and rapid restores. The StoreOnce Backup systems emulate both LTO tape autoloaders and libraries which are then recognized by the backup application as one or more physical tape devices. As compared to other disk-based data protection solutions, the advantages of using a virtual tape library are its ability to leverage and integrate into current tape backup environments, its ease of setup and management, and its minimal maintenance requirements.

When using the HP StoreOnce Backup system as a NAS target, one or more file shares can be created on each system which are then used by the backup application as either CIFS targets for backup. Recognized and supported by a wide range of backup applications and integrated backup agents, using the StoreOnce system as a NAS target provides a simple and cost-effective method to centralize and automate the backup of multiple servers in a non-tape environment.

The StoreOnce Backup system will appear to the backup application as a NAS device The StoreOnce Backup system should not be used as a generic file-share device and will not perform optimally if used as such as it has been designed and optimized for performing backup and hence includes data deduplication and support for low-bandwidth replication.

The OST plug-in is built upon the NAS foundation. The first step is to configure CIFS shares on the StoreOnce Backup systems. Next, the plug-in is installed on the Media Servers. Instead of directing backups directly to CIFS shares on the StoreOnce Backup systems, the backup administrator configures the Media Servers to use the OST plug-in. More importantly, deduplicated replication may be tracked within the backup application which maintains catalog information for both the local and the remote

copies of backup images.

* For legacy D2D backup systems (EJ001A, EJ002A, EH938A, EH939A, EH941A, EH942A, EH999A), the addition of NAS as a target for backup is limited to the CIFS protocol, suitable for use in Windows-only environments. Earliest legacy systems used authentication models for the CIFS protocol of "no authentication" or "local user level authentication". There was no support for Microsoft Active Directory authentication. However support for Microsoft Active Directory authentication is available on legacy systems via a free firmware upgrade by following the "Support & Drivers" link on www.hp.com/go/d2d or by following the "HP Support & Drivers" link from: www.hp.com EJ001C, EJ002C, EH993C EH996B, EH998B, EH985A and EH983B support CIFS, with Microsoft Active Directory authentication and NFS protocols.

Differences between using a NAS or a VTL target for the HP StoreOnce Backup system

For customers already familiar with or who plan to continue using tape automation in their backup environment, using VTL as a target for backup applications for the HP StoreOnce Backup system can provide some key advantages including:

- Ensuring best backup performance.
- The ability to leverage tape automation licensing that may already be in use with your backup application.

Customers who are more familiar with using file systems, and for those customers who may be moving away from using tape backup, may find using the StoreOnce Backup system as a NAS target provides a simpler way to configure their backup. Using the StoreOnce system as a NAS target for backup can also provide some key advantages including:

- No need for additional backup application licensing as most mainstream backup application and integrated backup agents include support for backup to CIFS and NFS devices.
- No need for expertise in traditional backup methods as backup to a file share provides a simple method for backup.
- An easily adaptable backup methodology for remote offices where local tape backup will not be deployed and IT resources are limited.

While using the StoreOnce Backup system as a NAS target for backup may provide a simple method for backup and recovery, there are a number of additional considerations one must be aware of when implementing this methodology including:

i. There is a restriction on the number of backups each file share can accept concurrently. This varies based on the backup application being used and what data type is being backed up. Please refer to the HP StoreOnce Backup systems Best Practices Guide for additional details.
ii. Deduplication will occur on any backup file that is greater than 24 MB. Backup applications may also create some small files during a backup job, these will not be deduplicated in order to ensure maximum performance and random access.
iii. NAS targets on the StoreOnce system are designed to be accessed for backup as such a file may only be accessed by a single user at a time - multiple users are not permitted to access the same file simultaneously.

There are significant differences between using a general NAS device and an HP StoreOnce Backup system with a NAS target for backup applications.

The HP ProLiant Storage Server family of NAS appliances provide general disk file share and protection for

Windows environments. The HP StoreOnce Backup systems have been specifically designed for backup and uniquely offer:

- Easier setup, maintenance and administration of backup
- Data deduplication functionality, allowing more backup data to be retained on disk for longer
- Low-bandwidth data replication for cost-effective off-site storage

The StoreOnce backup systems should not be used for general purpose NAS operations such as file sharing. The HP StoreOnce Backup system is designed for one particular usage model - as target storage device for backup applications. StoreOnce Backup systems include in-line data deduplication and support for low bandwidth replication (via a license) and is optimized for these features.

Migrating data to Tape

The StoreOnce Backup systems are an excellent solution for regular and daily backup with data deduplication allowing more data to be retained on disk for longer, and enabling network-efficient data replication to deliver a cost-effective off-site disaster recovery solution.

Using the StoreOnce device should should enable a significant reduction in the amount of data stored on physical tape, so that for example, there is no longer any need to store daily incremental backups on tape. However, HP still recommends periodic off-load to tape as the most cost-effective, energy efficient and robust solution for:

1. Long-term archival of data to meet regulatory requirements
2. Or off-site storage for disaster recovery where data replication is not an option

The frequency of copying data to tape will vary according to specific data protection requirements. Using a combination of both disk and tape can deliver all the benefits of disk for fast data backup and restore, and tape for additional levels of data protection, particularly over a period of multiple years.

When using the StoreOnce Backup system as a target for backup, there are two ways to periodically off-load data to tape using stand-alone tape drives, autoloaders or libraries

1. For highest performance, use a separate physical tape backup. This uses the backup application to create a completely separate tape backup from the server to a physical tape drive or library in parallel to the StoreOnce backup. However, this will require the user to periodically manage two separate backup processes (StoreOnce on a daily basis, and both StoreOnce and Tape where archival is being prepared).

For a straight-forward and easier to manage solution, and where performance is less of an issue, use backup application copy. This uses the backup application to copy cartridges or NAS file shares that have been backed up to the target StoreOnce backup system to a physical tape drive or library that is connected elsewhere in the storage network either directly connected to a media server or on a Fibre Channel SAN. This method may have a performance impact, as the data has to be re-assembled on the StoreOnce backup system for copy and performance depends on the number of streams read/copied in parallel.

Features and Benefits

HP LeftHand SAN Solutions - creating an end-to-end IP SAN storage solution with HP StoreOnce Backup systems

HP LeftHand P4000 SAN Solutions deliver enterprise functionality that enhances virtual environments, simplifies management, and reduces costs. Easy to deploy, scale and maintain, HP P4000 SAN Solutions ensure that crucial business data remains available. This innovative approach to storage provides unique double fault protection across the entire SAN, reducing vulnerability without driving up costs the way traditional SANs can.

When combined with HP StoreOnce Backup Solutions, users can create an affordable end-to-end IP SAN storage solution that is both easy to implement an easy to maintain. From entry-level solutions for a remote or branch office to mid-range solutions that scale for multiple sites, HP StoreOnce Backup systems provide the optimal balance of affordability, manageability, and reliability to handle the data protection needs of your HP P4000 SAN solution.

Models

For help with choosing the most appropriate StoreOnce Backup systems for your specific environment, we recommend you talk to your HP partner or sales advisor about using the HP Storage Sizing Tool which can be downloaded from the Downloads section of www.hp.com/go/d2dsizer

NOTE: HP StoreOnce disk-based backup systems now include the HP B6200 StoreOnce Backup system designed for enterprise level data protection. See www.hp.com/go/B6200 for more details

HP D2D4324 Backup system

Backup system for midsized to large data centers and as a replication target device for up to 50 remote or branch offices. The D2D4324 delivers a scalable 4U solution from 18 to 72 TB of usable capacity and speeds of up to 4TB/hour* for protection of up to 32TBs of data in an 8-hour window.

*Actual performance is dependent upon data set type, compression levels, number of data streams, number of devices emulated and number of concurrent tasks, such as housekeeping or replication.

HP D2D4312 Backup system

Backup system for midsized to large data centers and as a replication target device for up to 50 remote or branch offices. The D2D4312 delivers a scalable 4U solution from 9 to 36 TB of usable capacity and speeds of up to 2.4TB/hour* for protection of up to 19.2TBs of data in an 8-hour window. These devices automate the daily backup of multiple distributed servers through the flexibility of virtual tape library and NAS targets for backup applications.

*Actual performance is dependent upon data set type, compression levels, number of data streams, number of devices emulated and number of concurrent tasks, such as housekeeping or replication.

HP D2D4112 Backup system

Backup system for midsized data centers and as a replication target device for up to 24 remote and branch offices, the 2U D2D4112 series delivers a scalable solution from 9 to 18 TB of useable capacity using a simple and cost effective 2U capacity upgrade and speeds of up to 1.3TB/hour* for protection of up to 10.4TBs of data in an 8-hour window.. These devices automate the daily backup of multiple distributed servers through the flexibility of virtual tape library and NAS targets for backup applications.

*Actual performance is dependent upon data set type, compression levels, number of data streams, number of devices emulated and number of concurrent tasks, such as housekeeping or replication.

HP D2D4106 Backup system

Backup system for smaller data centers or remote and branch offices. The D2D4106 may also be a backup target for up to 16 remote sources. This 2U backup system delivers a scalable solution from 3 to 9 TB of usable capacity using a simple and cost effective 2U capacity upgrade and speeds of up to 800GB/hour* for protection of up to 6.4 TBs of data in an 8-hour window.

These devices automate the daily backup of multiple distributed servers through the flexibility of virtual tape library and NAS targets for backup applications.

*Actual performance is dependent upon data set type, compression levels, number of data streams, number of devices emulated and number of concurrent tasks, such as housekeeping or replication.

** For legacy D2D backup systems (EJ001A, EJ002A, EH938A, EH939A, EH941A, EH942A, EH999A), the addition of NAS as a target for backup is limited to the CIFS protocol, suitable for use in Windows-only environments. Earliest legacy systems used authentication models for the CIFS protocol of "no authentication" or "local user level authentication". There was no support for Microsoft Active Directory authentication. However support for Microsoft Active Directory authentication is available on legacy systems via a free firmware upgrade by following the "Support & Drivers" link on www.hp.com/go/d2d or by following the "HP Support & Drivers" link from: www.hp.com EJ001C, EJ002C, EH993C, EH996B, EH998B, EH985A and EH983B support CIFS, with Microsoft Active Directory authentication and NFS protocols.

HP D2D2502i, or D2D2504i Backup system

Entry level disk backup systems for remote or branch offices and smaller data centers, the 1U D2D2500 series offers a choice of 1.5 and 3 TB of usable capacity and speeds of up to 450GB/hour* to protect up to 3.6TBs of data in an 8-hour window. These devices automate the daily backup of up to 8 distributed servers through the flexibility of Virtual tape library and NAS targets for backup applications.

*Actual performance is dependent upon data set type, compression levels, number of data streams, number of devices emulated and number of concurrent tasks, such as housekeeping or replication.

Compatibility

HP extensive compatibility testing program assures that your HP StoreOnce Backup systems work with leading servers, operating systems, and backup applications, including those not manufactured by HP.

Server Compatibility

The HP StoreOnce Backup systems are supported on servers that use Microsoft Windows or Linux operating systems, including HP ProLiant, HP Integrity Servers and a variety of third-party servers.

For compatibility details on specific servers, refer to our website for the latest hardware compatibility information: http://www.hp.com/go/connect for D2D2500 D2D4000 and D2D4106 or http://www.hp.com/go/ebs for D2D4112, D2D4312 and D2D4324.

OS Support

The HP StoreOnce Backup systems are supported with Microsoft Windows, Linux, HP-UX and Solaris operating systems.

For more details, refer to our website for the latest information: http://www.hp.com/go/connect for D2D2500 and D2D4106 or http://www.hp.com/go/ebs for D2D4000 D2D4112,D2D4312 and D2D4324.

Software Support

The HP StoreOnce Backup systems are supported by a range of popular backup applications, including HP Data Protector software.

For details of specific backup application compatibility, refer to our website for the latest information: http://www.hp.com/go/connect for D2D2500 and D2D4106 or http://www.hp.com/go/ebs for D2D4112, D2D4312 and 4324.

Network Compatibility

For the best performance, the HP StoreOnce Backup systems should be connected to the servers it protects via a 1Gb or 10Gb (gigabit) Ethernet network, dependent on product. It is supported on all 1Gb or 10Gb Ethernet network interface cards (NICs) and switches, dependent on product. The devices will run on either IPv4 or IPv6 networks.

The HP StoreOnce Backup systems are also supported on 100 base-T Ethernet networks, but performance will be severely restricted. This product is not supported on networks using slower Ethernet technology. When using Virtual tape devices the StoreOnce Backup systems can communicate data over your Ethernet network using iSCSI technology:

- For Windows systems, this requires installation of the Microsoft iSCSI Initiator 2.02 or above) software driver on each server that will be backed up to the HP StoreOnce Backup system. This initiator is downloaded and installed from Microsoft automatically by the installation wizard and is also available via free download from the Microsoft website at: http://www.microsoft.com
- For supported Linux operating systems, a software iSCSI initiator is provided with the operating system but may need to be installed separately if not included in the initial operating system installation.

SAN Compatibility

The HP StoreOnce Backup systems support a variety of Fibre Channel switches and HBAs

For more details of SAN compatibility, refer to our website for the latest information: http://www.hp.com/go/ebs

Additionally, HP StoreOnce backup systems are compatible with HP's new portfolio of HP LeftHand P4000 SAN Solutions. For more information on HP LeftHand SAN Solutions, visit the HP website at: http://www.hp.com/go/lefthandnetworks

Service and Support, HP Care Pack, and Warranty Information

Warranty and Services Included with the Product

Hewlett-Packard provides a 1 year parts exchange, 1 year labor, 1 year on site, normal business hours, next business day response for HP D2D4004, D2D4009,D2D4112 and D2D4324 Backup systems, plus 9x5 phone support for the duration of the warranty.

The D2D2500 includes a1-year, next-day, parts exchange, limited warranty for the HP plus 9x5 phone support for the duration of the warranty.

Where a Tape Drive is attached to a StoreOnce Backup system, the tape drive carries its own separate warranty. Hewlett-Packard provides a 3-year, next-day, parts exchange, limited warranty for the HP Ultrium tape drive, plus 9x5 phone support for the duration of the warranty.

For more information about HP's Global Limited Warranty and Technical Support, visit:
ftp://ftp.compaq.com/pub/products/storageworks/warranty/321708-408.pdf

For increased uptime, productivity and ROI -HP Care Pack packaged services for Storage

These days, you need to get the most out of your storage investment-you can't afford not to. When you buy HP storage products and solutions, it's also a good time to think about what levels of service and support you may need. To help take the worry out of deploying, designing, maintaining, and managing your environment, we've designed a portfolio of service options that are as: flexible, reliable and scalable as your storage. Unlike storage-only vendors, we take a holistic approach to your entire environment, bridging storage, servers, blades, software and network infrastructures with our HP Care Pack packaged services for Storage.

Protect your business beyond the warranty

When it comes to robustness and reliability, standard warranties on today's computing equipment have matured just as the technologies have matured. Good news on some fronts-but also a source of potential problems and subsequent consequences that come from depending on standard warranties alone. Standard warranty protects against product defects and some causes of downtime- but not the business. By using a standard approach to warranty uplifts, such as HP Care Pack Services, you can reduce downtime risks and be more certain of operational consistency for both mission-critical and standard business computing. Simply put, HP Care Pack Services normalize the warranty of combined products - helping you proactively guard against unplanned downtime.

Extending warranties with HP Care Pack Services

For cost-effective upgrading or extending your standard warranty, HP Care Pack Services offer a suite of standard reactive hardware and software support services that are sold separately, or combined as with our Support Plus and Support Plus 24 services. The portfolio also provides a combination of proactive and reactive services, such as Proactive 24 Service and Critical Service. In addition, with HP Proactive Select we offer an innovative approach to service delivery that gives you the flexibility to acquire the specific proactive services you need today, then add services as your needs evolve. HP Proactive Select offers a broad set of technical or per-event type service options - including server, storage, and network, SAN device, and software, environment, installation and education services. Services that you can mix and match depending on your specific requirements, from preliminary planning and equipment delivery to installation, configuration, integration, and testing, through every level of ongoing support. Our HP Care Pack packaged services for Storage assures help when you need it most. And for many products, post-warranty HP Care Pack Services are available when your original warranty has expired.

HP Storage Services: Offering reliability, flexibility and value-just like your storage

HP Storage Services offers a full spectrum of customer care, from technology support to complex migrations to complete completely managed services. HP Factory Express provides customization, integration and deployment services for turnkey solutions. HP Education offers flexible, comprehensive training on storage networking, disk storage systems, and storage software to help your IT staff get the most out of your investments. And HP Financial solutions extend innovative financing and asset management programs to cost-effective buy, manage and eventually retire your older equipment.

HP Storage Services, the trusted business technology experts who manage your technology in action, because when technology

Service and Support, HP Care Pack, and Warranty Information

works, business works. http://www.hp.com/services/storage

NOTE: Care Pack Services availability may vary by product and country.

HP Care Pack Services are sold by HP and HP Authorized Service Partners:

- Services for customers purchasing from HP or an enterprise reseller are quoted using HP order configuration tools.
- Customers purchasing from a commercial reseller can find HP Care Pack Services at: http://www.hp.com/go/lookuptool

Recommended HP Care Pack Services for optimal satisfaction with your HP product.

Service and Support	**Technology Services for increased uptime, productivity and ROI** TRUST HP storage technology experts for every level of service and support. Our integrated portfolio of Services for storage help customers reduce costs, optimize data, streamline storage management, and improve backup and recovery. Capitalizing on HP Storage systems' capabilities requires a service partner who understands your increasingly complex environment. Team with the people who know HP infrastructure hardware and software best-the experienced professionals at HP Services. **Protect your business beyond warranty** Warranty protects against manufacturer defects, however warranty uplifts, such as HP Care Pack Services protect the business-by reducing downtime risks and providing operational consistency for mission-critical and standard business computing. **What HP Storage Technology Services can do for you** HP Storage Technology Services can help you design, deploy, test, integrate, support, and manage IT and infrastructure solutions. HP storage lifecycle support services offers a full spectrum of customer care-from technology support to complex migrations to complete managed services. **Choose the right level of support, deployment and integration services** HP support recommendations are designed to help you enhance technology operations and lower risk-and make it easier for you to seek the right balance between affordability and service-level commitments. Depending on your individual support needs, choose from three levels of care that cover the entire lifecycle to better address your needs-Optimized Care, Standard Care, and Basic Care. If none of our support recommendations meet your needs, we can tailor a service solution for your unique support requirements. Only HP brings together deep expertise, proactive and business critical support and a strong partner network-plus, a full set of infrastructure services designed to power a Converged Infrastructure.
Optimized Care- delivers best performance and stability through deployment and proactive management practices	**HP Proactive Care 24x7-** for a higher return on your storage investment, Proactive Care delivers hardware and software support services designed specifically for your technology; rapid access to Advanced Solution Center Specialists plus, Firmware/Software management and best practice advice. Customers can optimize the return on their IT investment and realize the advantage of running their business critical applications on virtualized/x86 infrastructure. **Plus,40 credits per year**, select from an extensive menu of consultancy and technical services, such as onsite firmware upgrades, health checks, assessments, and education.
Standard Care-maintains high level of uptime, along with expert help to cut the	**HP Proactive Care 24x7**- for a higher return on your storage investment, Proactive Care delivers hardware and software support services designed specifically for your technology; rapid access to Advanced Solution Center Specialists plus, Firmware/Software management and best practice advice. Customers can

Service and Support, HP Care Pack, and Warranty Information

cost and complexity of implementation and support	optimize the return on their IT investment and realize the advantage of running their business critical applications on virtualized/x86 infrastructure. **Plus, 10 credits per year**, select from an extensive menu of consultancy and technical services, such as onsite firmware upgrades, health checks, assessments, and education.
Basic Care-Minimum recommended support	**3-Year Support Plus 24**-For a higher return on your server and storage investment, HP Support Plus 24 provides integrated hardware and software support services designed specifically for your technology. Available 24x7, this 3-year combined reactive support option delivers onsite hardware support and over-the-phone software support around-the-clock. Leverage the full strength of HP Technology Services - customers can trust the services professionals at HP to work collaboratively with them, putting our strategic and technical know-how to work across their entire infrastructure. **Plus, 10 credits per year**, select from an extensive menu of consultancy and technical services, such as onsite firmware upgrades, health checks, assessments, and education. Plus, 10 credits per year, select from an extensive menu of consultancy and technical services, such as onsite firmware upgrades, health checks, assessments, and education
Implementation	**Installation**: HP Installation and Startup Service for StoreOnce Backup system. For efficient deployment and integration into your environment, this service provides the necessary activities required to deploy your StoreOnce Backup system. Benefits- Proper installation, configuration, and connection of the StoreOnce Backup system is essential for managing your backup data and making it readily available when needed http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA2-9557ENW.pdf **HP Proactive Select: Accelerate the ROI of your technology investment** HP Proactive Select is a flexible way to purchase services to fit your particular environment or situation. Working with an HP Account Support Manager, you select a 'package' of services, from a wide range of proactive services offered by HP spanning many technologies and processes-- such as onsite firmware upgrades, health checks, assessments, and education. You tailor the service delivery to improve time-to-production, optimize performance, or build in continuous improvements The link to the datasheet is as follows: http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA2-3842ENW.pdf **HP Backup and Recovery Solution Service.** Professional backup and recovery planning that aligns with customer's business needs and implementation. Benefits-HP's expertise with backup helps to reduce project executive time and lower risk to the storage environment. http://h20195.www2.hp.com/V2/GetPDF.aspx/5982-7442EN.pdf
Remote Support Tools	**HP Insight Remote Support:** Available at no additional cost to all warranty, HP Care Pack Service and service agreement customers, uses proven technology to deliver secure, reliable 24x7 remote monitoring, diagnosis and problem resolution. http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA2-4676ENW.pdf
For more information	www.hp.com/services/storage To learn more on HP Storage Services, please contact your HP sales representative or HP Authorized Channel Partner P Care Pack Services are sold by HP and HP Authorized Service Partners:

Service and Support, HP Care Pack, and Warranty Information

- Services for customers purchasing from HP or an enterprise reseller are quoted using HP order configuration tools.
- Customers purchasing from a commercial reseller can find HP Care Pack Services at www.hp.com/go/lookuptool

Configuration Information

Step 1 - Select a Configuration

Select one:

	Part Number
HP D2D4324 Backup system	EH985A
D2D4324 Backup system with 24 TB of disk storage **Kit Contents:** D2D4324 Backup system (12 x 2 TB disks) Ethernet cable(Cat 5e) 3m (x2) 2 x Power cords (with IEC 320 C13 plug for Rack PDU) Installation poster HP StoreOnce Backup system CD (contains installation wizard, device drivers, and documentation, all localized in multiple languages)	
HP D2D4324 Capacity Upgrade	EH986A
D2D4324 Backup system upgrade kit, D2600 base enclosure offering additional 24 TB of disk storage **Kit Contents:** D2600 with 12 x 2TB discs MSA60 base enclosure with redundant power supplies and fan modules Rack-mounting hardware kit 0.5m mini-SAS cable Two AC power cords and two PDU interconnect cords Entitlement certificate Installation instructions	
HP D2D4312 Backup system	EH983B
D2D4312 Backup system with 12 TB of disk storage **Kit Contents:** D2D4312 Backup system (12 x 1 TB disks) Ethernet cable(Cat 5e) 3m (x2) 2 x Power cords (with IEC 320 C13 plug for Rack PDU) Installation poster HP StoreOnce Backup System CD (contains installation wizard, device drivers, and documentation, all localized in multiple languages)	
HP D2D4112 Backup system	EH993C
D2D4112 Backup system with 12 TB of disk storage **Kit Contents:** D2D4112 Backup system (12 x 1 TB disks) Ethernet cable(Cat 5e) 3m (x2) 2 x Power cords (with IEC 320 C13 plug for Rack PDU) Installation poster HP StoreOnce Backup system CD (contains installation wizard, device drivers, and documentation, all localized in multiple languages)	

Configuration Information

HP D2D4112/4312 Backup system Capacity Upgrade Kit EH995B

D2D4112 Backup system upgrade kit, D2600 base enclosure offering additional 12 TB of disk storage

Kit Contents:

HP 60 Modular Storage Array with 12 x 1TB discs
MSA60 base enclosure with redundant power supplies and fan modules
Rack-mounting hardware kit
0.5m mini-SAS cable
Two AC power cords and two PDU interconnect cords
Entitlement certificate
Installation instructions

HP D2D4106i Backup system EH996B

D2D4106i Backup system with 6 TB of disk storage

Kit Contents:

D2D4106i Backup system (12 x 500 GB disks)
Ethernet cable(Cat 5e) 3m (x2)
2 x Power cords (with IEC 320 C13 plug for Rack PDU)
Installation poster
HP StoreOnce Backup system CD (contains installation wizard, device drivers, and documentation, all localized in multiple languages)

HP D2D4106fc Backup system EH998B

D2D4106fc Backup system with 6 TB of disk storage

Kit Contents:

D2D4106fc Backup system (12 x 500 GB disks)
Ethernet cable(Cat 5e) 3m (x2)
2 x Power cords (with IEC 320 C13 plug for Rack PDU)
Installation poster
HP StoreOnce Backup system CD (contains installation wizard, device drivers, and documentation, all localized in multiple languages)

HP D2D4904 Capacity Upgrade EH944A

D2D4904 Capacity Upgrade, enables the D2D4004 products to be upgraded to D2D4009 capacity product

Kit Contents:

6 x 750 GB discs
Entitlement certificate
Installation booklet

HP D2D4106 Capacity Upgrade EH997B

D2D4106 Backup system upgrade kit, D2600 base enclosure offering additional 6 TB of disk storage

Kit Contents:

12 x 500 GB discs
Entitlement certificate
Installation booklet

HP D2D2504i Backup system EJ002C

D2D2504i Backup system with 4 TB of disk storage

Kit Contents:

D2D2504i Backup system
4x 1 TB Hot swap hard drives
Ethernet cable(Cat 5e) 3m (x2)
Power cable (IEC 320 C13 Connector for Rack PDU)
Installation poster
HP D2D2500 Backup System CD(contains installation wizard, device drivers, and documentation, all localized in multiple languages)

HP D2D2502i Backup system EJ001C

D2D2502i Backup system with 2 TB of disk storage

Kit Contents:

D2D2502i Backup system (4 x 500 GB hard disk drives)
Ethernet cable(Cat 5e) 3m (x2)
Power cable (IEC 320 C13 Connector for Rack PDU)
Installation poster
HP D2D2500 Backup system CD (contains installation wizard, device drivers, and documentation, all localized in multiple languages)

NOTE: D2D2500 units may be installed outside of a rack but this is not recommended by HP. If installed outside of a rack, the D2D2500 unit should be kept in a horizontal fashion, on a flat surface, at a location where there is no obstruction in the front and back of the system for free air flow at the right temperature, and without any other system or weight stacked on top of the system. In addition, the D2D2500 ships standard with a power cord to connect to a PDU inside of a rack. If the unit needs to be powered using a 110V receptacle (NEMA-15), the NEMA power cord (227099-001) must be ordered separately. If the unit requires a local power cord, please check the power cord matrix at: http://www.hp.com/go/powercordmatrix for the appropriate cord.

HP strongly recommends that D2D2500 units be installed inside a rack to ensure the unit operates in normal operating parameters as defined in the Technical Specifications section of this document.

Step 2- Related Options

Replication Licenses	HP D2D4324 Replication License	EH987A
	HP D2D4312 Replication License	EH984A
	HP D2D4112 Replication License	EH994A
	HP D2D4106 Replication License	EH999A
	HP D2D4000 Replication License	EH991A

HP D2D2500 Replication License	EH990A
HP D2D4324 Replication License E-LTU	EH987AAE
HP D2D4312 Replication License E-LTU	EH984AAE
HP D2D4112 Replication License E-LTU	EH994AAE
HP D2D4106 Replication License E-LTU	EH999AAE
HP D2D4000 Replication License E-LTU	EH991AAE
HP D2D2500 Replication License E-LTU	EH990AAE

- These licenses enable an appliance to host replication target libraries. (No license is required for appliances which only act as replication sources)
- Licensing is "per appliance" i.e. A single license is required to enable an appliance to host as many replication target libraries as it is capable of
- Licenses are delivered via www.webware.hp.com and are node-locked by appliance serial number (and are not transferable)
- Licenses also include an account providing authorization to download the HP StoreOnce Replication Manager 2.0 software which allows users to monitor, report and manage multiple StoreOnce backup systems' GUI's through a single management console. Replication Manager 2.0 provides an easier way to monitor backup targets showing trends analysis, enhanced topology view and email alert notification for up to 400 StoreOnce backup systems, being replicated to a central site.
- Download instructions of HP StoreOnce Replication Manager 2.0 are included when the replication license is downloaded
- This account license also provides authorization to download the HP OST Plug-in which enables NetBackup to manage deduplicated replication between StoreOnce appliances. Two replication licenses are required in Active/Active environments only. However no replication licenses are required when using backup and restore functions only. Total number of source appliances that can replicate into a single target appliance is as follows:
  - D2D4324 target supports up to 50 source StoreOnce appliances
  - D2D4312 target supports up to 50 source StoreOnce appliances
  - D2D4112 target supports up to 24 source StoreOnce appliances
  - D2D4106i target supports up to 24 source StoreOnce appliances
  - D2D4106fc target supports up to 24 source StoreOnce appliances
  - D2D2504i target supports up to 8 source StoreOnce appliances
  - D2D2502i target supports up to 4 source StoreOnce appliances

NOTE: Replication Manager software is available with the following replication licenses (EH990A, EH991A, EH994A, EH984A, EH999A and EH985A). In order to benefit from Replication manger, StoreOnce backup systems require the latest firmware, which can be obtained via a free firmware upgrade by following the "Support & Drivers" link on www.hp.com/go/d2d or by following the "HP Support & Drivers" link from: www.hp.com

Direct Attach Cable	HP 0.5m SFP+ 10GbE Copper Cable	487649-B21
	HP 1m SFP+ 10GbE Copper Cable	487652-B21
	HP 3m SFP+ 10GbE Copper Cable	487655-B21
	HP 5m SFP+ 10GbE Copper Cable	537963-B21
	HP 7m SFP+ 10GbE Copper Cable	487658-B21

		NOTE: Direct Attach Cable (DAC) must be purchased separately for copper environments.	
	Fiber Optic Modules	HP BLc 10Gb SR SFP+	455883-B21
		HP BLc10Gb LR SFP+	455886-B21
		HP BLc 10Gb LRM SPF+	455889-B21
		NOTE: Fiber transceivers and cables must be purchased separately for fiber-optic environments.	
	Fiber Optic Cables	HP 2m SW LC/SC FC Cable Kit	221691-B21
		HP 5m SW LC/SC FC Cable Kit	221691-B22
		HP 15m SW LC/SC FC Cable Kit	221691-B23
		HP 2m SW LC/LC FC Cable Kit	221692-B21
		HP 5m SW LC/LC FC Cable Kit	221692-B22
		HP 15m SW LC/LC FC Cable Kit	221692-B23
		HP 30 m LC-LC Multi-Mode OM2 Fiber Optic Cable	221692-B26
		HP 50 m LC-LC Multi-Mode OM2 Fiber Optic Cable	221692-B27
		HP .5 m LC-LC Multi-Mode OM3 Fiber Optic Cable	AJ833A
		HP 1 m LC-LC Multi-Mode OM3 Fiber Optic Cable	AJ834A
		HP 2 m LC-LC Multi-Mode OM3 Fiber Optic Cable	AJ835A
		HP 5 m LC-LC Multi-Mode OM3 Fiber Optic Cable	AJ836A
		HP 15 m LC-LC Multi-Mode OM3 Fiber Optic Cable	AJ837A
		HP 30 m LC-LC Multi-Mode OM3 Fiber Optic Cable	AJ838A
		HP 50 m LC-LC Multi-Mode OM3 Fiber Optic Cable	AJ839A
		NOTE: Fiber transceivers and cables must be purchased separately for fiber-optic environments.	
		NOTE: For additional information on 10Gb cable specifications go to: http://www.hewlett-packard.com/rnd/pdfs/10gig_cabling_technical_brief.pdf	
Rack-mount Options	**Rack-mount Tape Drive Kits**		
		NOTE: Connecting a tape drive option to the StoreOnce Backup systems requires installation of the appropriate host bus adapter. Please select an option from the list provided below.	
		HP 1U SCSI Rack-mount Kit	A7445B
		HP 1U SAS Rack-mount Kit	AE459B
		HP 3U SCSI Rack-mount Kit	274338-B22
		HP 3U SAS Rack-mount Kit	AG576B

Technical Specifications

	D2D2502i	D2D2504i	D2D4106i /fc	D2D4112	D2D4312	D2D4324
Form Factor	1U Rack	1U Rack	2U scalable rack	2U scalable rack	4U scalable rack	4U scalable rack
Total Capacity (Raw)	2 TB	4 TB	Up to 12 TB**	Up to 24 TB**	Up to 48 TB**	Up to 96 TB**
Total Capacity (Useable)	1.5 TB	3 TB	Up to 9 TB**	Up to 18 TB**	Up to 36 TB**	Up to 72 TB**
Data Deduplication Usable capacity using data deduplication at 20:1*	30 TB	60 TB	180 TB	360 TB	720 TB	1.4 PB
Replication	Supports data replication between StoreOnce appliances. Replication is automatic and appliances may function as both replication targets and sources simultaneously with a license only being required for any appliance acting as a target. Replication Manager provides an easier way to manage a large number of devices being replicated across numerous sites and is included with the license. HP's OST plug-in integrates deduplicated replication with Symantec backup applications and is also included with the replication license. Replication Manager software is available with the following replication licenses (EH991A, EH994A, EH984A, EH999A, EH985A). In order to benefit from Replication manger, StoreOnce backup systems require the latest firmware, which can be obtained via a free firmware upgrade by following the "Support & Drivers" link on www.hp.com/go/d2d or by following the "HP Support & Drivers" link from: www.hp.com					
OST v1.2	ISV Support: NetBackup (NBU) 6.5.x/ 7.0.1/7.1 on Windows, Linux, Solaris (SPARC v10) and HPUX IA64 (64-bit). Media Server OS Support: Windows: Windows 2003 32 bit, Windows 2003 64 bit, and Windows 2008 64 bit Linux: Red Hat Enterprise Linux 4.x, 5.x & 6.x, Novell SUSE Linux Enterprise Server 10.x & 11.x Basic Functionality: HP OST plug-in v 1.2 provides backup, restore and optimized duplication operations of Symantec NBU on the Gen 2 HP StoreOnce Backup systems (4324, 4312, 4112, 4106, 2504, 2502). It supports Active/Active & Active/Passive environments while reporting de-dupe ratio's per LSU. Max target shares/LSUs: NBU: Multi device () fan in up to 10:1 (2: 1; 4:1; 6:1, 6:1, 10:1, 10:1 (2502, 2504, 4106, 4112, 4312, 4324) & up to 25 LSUs (4, 8,12,12,25,25 on D2D2502,2504,4106,4112,4312,4324)					
Targets for backup applications	Virtual tape library and NAS **NOTE:** For legacy D2D backup systems (EJ001A, EJ002A, EH938A, EH939A, EH941A, EH942A, EH999A), the addition of NAS as a target for backup is limited to the CIFS protocol, suitable for use in Windows-only environments. However EJ001C, EJ002C, EH993C EH996B, EH998B, EH985A and EH983B support CIFS and NFS protocols.					
Maximum number of source appliances per target appliance (fan in)	4	8	24	24	50	50
Disk Drive Capacity, Type	500 GB, SATA 7200rpm, 3.5 inch	1 TB, SATA 7200rpm, 3.5-inch	500 GB, SATA 7200rpm, 3.5-inch	1 TB, SATA 7200rpm, 3.5-inch	1 TB, SATA 7200rpm, 3.5-inch	2 TB, SAS 7200rpm, 3.5-inch

Technical Specifications

Number of Disk Drives	4	4	12 (min), 12 x 2 (max)	12 (min) , 12x2 (max)	12 (min) , 12x 4 (max)	12 (min) , 12x 4 (max)
RAID Support	Hardware RAID 5	Hardware RAID 5	Hardware RAID 6 1 RAID hot spare drive per shelf	Hardware RAID 6 1 RAID hot spare drive per shelf	Hardware RAID 6 1 RAID hot spare drive per shelf	Hardware RAID 6 1 RAID hot spare drive per shelf
Performance (maximum aggregated data transfer rate)	325GB/hr (90 MB/s)	450GB/hr (125 MB/s)	800 GB/hr*** (222 MB/s)	1.3TB/hr*** (360 MB/s)	2.75TB/hr*** (800 MB/s)	4TB/hr*** (1100 MB/s)
Device Interface	2 x 1 Gb iSCSI (Ethernet) (also supports 100 base-T)	2 x 1 Gb iSCSI (Ethernet) (also supports 100 base-T)	2 x 1 Gb iSCSI (Ethernet) OR 2 x 8 Gb Fibre Channel and 2 x 1 Gb iSCSI (Ethernet) (also supports 100 base-T)	2 x 8 Gb Fibre Channel and 2 x 1 Gb iSCSI (Ethernet) (also supports 100 base-T)	2 x 8 Gb Fibre Channel and 2 x 10 Gb iSCSI (Ethernet) (also supports 100 base-T)	2 x 8 Gb Fibre Channel and 2 x 10 Gb iSCSI (Ethernet) (also supports 100 base-T)
Tape Devices Emulated	HP LTO- 2 Ultrium Tape Drive /LTO-3 Ultrium Tape Drive/LTO-4 Ultrium Tape Drive/LTO-5 Ultrium Tape Drive in HP 1/8 G2 Tape Autoloader, MSL2024 Tape Library, MSL4048 Tape Library, MSL8096 Tape Library, HP StoreOnce Backup system Generic Library with HP Ultrium D2D Generic tape drive					
Number of Virtual Tape Libraries and NAS backup targets (combined)	4	8	16	24	50	50
Maximum Number of Cartridges Emulated (Assumes up to 24 generic 4 drive libraries with 96 slots)	192	384	1536	3456	51200	51200
Direct attach Tape Drives Supported (Legacy systems purchased before June 2010 VTL only, not supported with NAS targets, - requires pSCSI or SAS HBA D2D4312 requires Fibre Channel HBA supplied)	HP LTO-5 (Ultrium 3000 and Ultrium 3280) tape drives HP LTO-4 (Ultrium 1840 and Ultrium 1760) tape drives, HP LTO-3 (Ultrium 920 and Ultrium 960) tape drives and HP LTO-2 (Ultrium 448 and Ultrium 460) tape drives as standalone or configured in HP 1/8 G2 Autoloader, MSL2024, MSL4048 or MSL8096 Tape Libraries Tape Libraries. **NOTE:** Direct tape offload is only available on legacy systems* and is not supported with NAS targets. The recommended method of tape offload for virtual tape is to use the backup application to control and manage the copy of virtual to physical media. * Legacy D2D backup systems include (EH993A, EH938A, EH939A, EH941A, EH942A, EJ001A, EJ002A)					

*Actual results of data deduplication will vary with data type, change rates over time and backup methodologies used. Assuming standard business data mix and extended on-disk retention, typically a 20:1 data deduplication ratio could be assumed with a weekly full and daily incremental backup model.
** Assumes use of capacity upgrade kit to achieve maximum capacity
*** Assumes use of capacity upgrade kit to achieve maximum performance

Dimensions (HxWxD)	**Shipping** (D2D2502i, 2504i)	8.88 x 23.31 x 38.56 in (22.5 x 59.2 x 97.9 cm)
	Out of box (D2D2502i, , 2504i)	1.70 x 17.64 x 26.85 in (4.32 x 44.80 x 68.20 cm)

Technical Specifications

	Shipping (D2D4112, D2D4106	11.3 x 23.0 x 38.9 in (28.7 x 58.4 x 98.8 cm)
	Out of box (D2D4112, D2D4106	3.5 x 18 x 28.2 in (8.9 x 45.7 x 71.6 cm)
	Shipping (D2D4312, D2D4324)	15.0 x 23.9 x 36.2 (37.4 x 60.6 x 91.7 cm)
	Out of box (D2D4312, D2D4324)	6.9 x 19.1 x 28.7 (17.5 x 48.5 x 73.0 cm)
	Shipping (D2D4324, D2D4112/4312, D2D4106) capacity upgrade)	11.6 x 23.5x35 in (29.5 x 59.7 x 88.5cm)
	Out of box (D2D4324, D2D 4112/4312, D2D4106) capacity upgrade)	3.44 x 17.64 x 23.25 in (8.75 x 44.80 x 59 cm)
Weight (Approx)	**Shipping** (D2D2502i, 2504i)	51.00 lb (23 kg)
	Shipping (D2D4112 D2D4106)	71.5 lbs
	Shipping (D2D4324, D2D4312)	112.1 lbs (49.5 Kg)
	Shipping (D2D4324, D2D4112/4312 capacity upgrade)	84 lbs (38kg)
	Out of box (D2D2502i, 2504i)	37.00 lb (16.78 kg)
	Out of box (D2D4106)	57 lbs (25.8kg)
	Out of box (D2D4324, D2D4312)	82.7 lbs (37.5 Kg)
	Out of Box (D2D4324, D2D4106, D2D4112/ D2D4312 capacity upgrade)	55 lbs (25kg)
Power Requirements (per power supply)	**Range Input Voltage**	100 - 240 VAC
	Rated Input Frequency (D2D4112 and capacity upgrade)	50 to 60 Hz
	Rated Input Frequency (D2D2502, 2504)	47 to 63 Hz
	Rated Input Current (D2D4112, D2D4106)	9.10 A (at 100 VAC), 4.5 A (at 200 VAC)
	Rated Input Current (D2D4324, D2D4312)	6.90 A (at 100 VAC), 2.90 A (at 240 VAC)
	Rated Input Current (D2D4324, D2D4112/4312 capacity upgrade)	3.9 A (at 100 VAC), 6A Maximum

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	Rated Input Current (D2D2502, 2504)	10.0 A (at 115 VAC) 5.5A (at 230 VAC)
	BTU Rating (D2D4112 D2D4106)	Maximum 1681 BTU/hr (at 100 VAC) 1646 BTU/hr (at 240 VAC)
	BTU Rating (D2D4106)	Maximum 1815 BTU/hr (at 100 VAC) 1776 BTU/hr (at 240 VAC)
	BTU Rating (D2D4312 D2D4324)	Maximum 2325 BTU/hr (at 100 VAC) 2270 BTU/hr (at 240 VAC)
	BTU Rating (D2D2502, 2504)	Maximum 940 BTU/hr (at 100 VAC) 907 BTU/hr (at 240 VAC)
	Rated Steady-state Power (D2D4312, D2D4324)	552 W (at 100 VAC), 536 W (at 240 VAC)
	Rated Steady-state Power (D2D4112, D2D4106)	360 W (at 100 VAC), 386 W (at 240 VAC)
	Rated Steady-state Power (D2D2502, 2504)	215W (at 100 VAC), 211W (at 240 VAC)
	Rated Steady-State Power (D2D4106)	410 W (at 100 VAC), 430 W (at 240 VAC)
	Maximum Peak Power (D2D4312, D2D4324)	682 W (at 100 VAC), 666 W (at 240 VAC)
	Maximum Peak Power (D2D4112, D2D4106)	500W (at 100 VAC), 515 W (at 240 VAC)
	Maximum Peak Power (D2D4004, D2D4009, D2D4106)	540 W (at 100 VAC), 550 W (at 240 VAC)
	Maximum Peak Power (D2D2502 and D2D2504)	280W (at 100 VAC), 280 W (at 240 VAC)
	Maximum Peak Power	385 W (at 100 VAC), 390 W (at 240 VAC)
Relative Humidity (non-condensing)	**Operating**	10 to 90% relative humidity (Rh), 82.4° F (28° C) maximum wet bulb temperature, non-condensing
	Non Operating	5 to 95% relative humidity (Rh), 101.7° F (38.7° C) maximum wet bulb temperature, non-condensing
Temperature Range D2D 2502i, 2504i, D2D4112, D2D4106, D2D4312 D2D4324	**Operating**	50° to 95°F (10° to 35°C) at sea level with an altitude derating of 1.8°F per every 1000 ft (1.0°C per every 305 m) above sea level to a maximum of 10,000 ft (3050 m), no direct sustained sunlight. Maximum rate of change is 18°F/hr (10°C/hr). The upper limit may be limited by the type and number of options installed. system performance may be reduced if operating with a fan fault or above 86°F (30°C)
	Non Operating (D2D2502i, 2504i, D2D4112, D2D4106, D2D4312, D2D4324)	22° to 140° F (-30° to 60° C). Maximum rate of change is 36° F/hr (20° C/hr)

Technical Specifications

	Non Operating (D2D4324, D2D4112/4312 capacity upgrade)	-40° to 150° F (-40° to 66° C)
	Heat Dissipation (maximum) D2D4324, D2D4112/4312 capacity upgrade	1175 Btu/hr* * Input Power and Heat Dissipation specifications are maximum values and apply to worst-case conditions at full rated power supply load. The power/heat dissipation for your installation will vary depending on the equipment configuration.
Acoustic Noise D2D4112/ D2D4106/ D2D4312/ D2D4324	**Idle** (disks spinning)	Listed are the declared A-Weighted sound power levels (LWAd) and declared average bystander position A-Weighted sound pressure levels (LpAm) when the product is operating in a 23°C ambient environment LWad 6.7 B LpAm 51 dBA LWad 4.9 B LpAm 31 dBA (D2D4312 only)
	Operating (random seeks to disks)	Listed are the declared A-Weighted sound power levels (LWAd) and declared average bystander position A-Weighted sound pressure levels (LpAm) when the product is operating in a 23°C ambient environment LWad 6.7 B LpAm 51 dBA LWad 5.0 B LpAm 32 dBA (D2D4312 only)
Acoustic Noise D2D2502i, 2504i)	**Idle** (disks spinning)	Listed are the declared A-Weighted sound power levels (LWAd) and declared average bystander position A-Weighted sound pressure levels (LpAm) when the product is operating in a 23°C ambient environment. Noise emissions were measured in accordance with ISO 7779 (ECMA 74) and declared in accordance with ISO 9296 (ECMA 109). LWAd 6.82 B LpAm 51.93 dBA
	Operating (random seeks to disks)	Listed are the declared A-Weighted sound power levels (LWAd) and declared average bystander position A-Weighted sound pressure levels (LpAm) when the product is operating in a 23°C ambient environment. Noise emissions were measured in accordance with ISO 7779 (ECMA 74) and declared in accordance with ISO 9296 (ECMA 109). LWAd 6.84 B LpAm 51.93 dBA

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For hard drives, 1 GB = 1 billion bytes. Actual formatted capacity is less.